Rainfall Estimates using NEXRAD Technology

NEXRAD Technology
- **National Weather Service deployed Next Generation Radar (NEXRAD) a.k.a. WSR-88D Weather Radar**
- **Opportunity to improve the spatial estimation of rainfall amounts**
- **NEXRAD sends out a radio signal and measures the signal reflected from falling raindrops (reflectivity)**
- **NEXRAD uses reflectivity to estimate the amounts of rainfall (using calibrated algorithms)**
- **It can measure reflectivity out to a distance of 230 km**
- **District areal coverage comes from 5 radars (Tampa, Melbourne, Jacksonville, Miami and Key West)**
- **NEXRAD data are available with 2km x 2km grid resolution every 15 minutes**

Rainfall Estimates are derived by
- **Empirical Look-up Table**
  - **Using upper air parameters, reflectivity values and observed rainfall**

NEXRAD Data is Acquired from OneRain, Inc. By
- **South Florida Water Management District**
- **St. Johns River Water Management District**
- **Suwannee River Water Management District**
- **Southwest Florida Water Management District**

NEXRAD Data Acquisition
- **Annual purchase order with OneRain, Inc.**
  - **under 5-year St Johns River W.M.D. Contract beginning May 2002**
- **NEXRAD data obtained from January 1, 2002 to current**
- **Near real-time (NRT) data product for current month**
- **End-of-the-Month (EOM) data product**

NEXRAD Data Characteristic
- **2 km X 2 km grid (= 1 pixel)**
- **35 mile boundary buffer around District boundaries**
- **base map (in state plane coordinates)**
- **Total 33,774 pixels (polygons)**
  - **~ 12,000 pixels within District**
- **Unique pixel id (8 digit integer e.g., 10074793) based on ArcHydro schema**

NEXRAD Data Types
- **Near Real-time (NRT) Data**
  - **District receives 15-min NEXRAD data every 15-minute interval**
  - **This data is rain-gage adjusted every 15-minute Rain gage data are obtained from 80 telemetry stations**
- **End-of-the-Month (EOM) Data**
  - **NRT data is revised with additional 110 rain gages using 15 min. data obtained from CR10 stations**
  - **Perform complex adjustments and QA/QC**

NEXRAD Near Real-Time Data Characteristic
- **Uses only gages over the District**
- **Delivery delayed by 5 to 20 minutes**
- **Uniform gage adjustment**
  - **No warping of radar rainfall estimates**
- **Does not eliminate bad gage data**
- **Might be inconsistent from District to District**

NEXRAD End-of-the-Month Data Characteristic
- **Use all available rain gages data**
- **Delivery in about 7 days from end of the month**
- **"Brandes" adjustment method**
  - **Softly warps radar rainfall estimates to match gages**
  - **Does not force radar to match rain gage estimate**
- **Eliminate bad rain gage data**
- **Consistent rainfall estimates from District to District**

NEXRAD Data Retrieval Application
- **Access via Corporate Database (DBHYDRO) – only on IWEB for now**
- **Web enabled application**
- **Map based and text based application**
- **Temporal data aggregation (hourly, daily, event, monthly, annual time-frames)**
- **Spatial data aggregation (rain areas, basins, counties, entire District)**
- **Data output in both tabular and map image format**